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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/752,102	12/29/2000	Christian E. Elling	45579-0001	8238

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EXAMINER	
SHIBUYA, MARK LANCE	

ART UNIT	PAPER NUMBER
1639	

DATE MAILED: 05/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/752,102	ELLING ET AL.	
	Examiner	Art Unit	
	Mark Shibuya	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-79* is/are pending in the application.

4a) Of the above claim(s) *7-46,52-66,72-76 and 79* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *7-46,52-66,72-76 and 79* is/are objected to.

8)☐ Claim(s) *1-6,47-51,67-71,77,78* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 5-46, 52-66, 72-76 and 79 are objected to under 37 CFR § 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further considered for restriction. Should applicant amend said claims that are objected to, and thereby place those claims in proper dependent form, or rewrite said claims so as to be in independent form, those claims would then be considered for restriction.

Election/Restrictions

2. The applicant is invited to note please, that claims 67, 68, 70, and 71 are listed as "Group IV, etc." but in actuality contain within those claims a large number of separate and distinct inventions. If claims 67, 68, 70, and 71 are elected, election of a *single invention* from within this group of claims is required as specifically set forth (see Group IV, etc., below).

3. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1, 2, 3 and 6, drawn to a drug discovery process for identification of a small organic compound comprising mutating a biological target and further comprising contacting the mutated biological target with one or more members of a library of test compounds comprising at least two heteroatoms for chelating a metal ion, classifiable in class 435, subclass 471, for example.

II. Claims 4, 5 and 6, drawn to a drug discovery process for identification of a small organic compound comprising a biological target molecule with at least one metal ion binding site further comprising contacting the biological target with a test compound one or more members of a library of test compounds comprising at least two heteroatoms for chelating a metal ion, classifiable in class 435, subclass 4, for example.

III. Claims 47-51, 77 and 78, drawn to a method of identifying a metal ion binding site in a biological target molecule, including a protein, and to characterizing an orphan receptor, comprising contacting a test compound comprising at least two heteroatoms for chelating a metal ion, classifiable in class 435, subclass 7.1, for example.

IV, etc. Claims 67, 68, 70, and 71, drawn to a chemical library comprising a plurality of test compounds of the general formula I, classifiable in class 514, subclass 75, 184, for example.

It is noted that claims 67, 68, 70, and 71 contain a large number of independent and distinct inventions. If this group is selected, then election of a single invention wherein the following symbols of formula I are defined is required:

F, G, X, n, Y, and m must all be specifically defined.

Each of F, G, X, n, Y, and m must be specifically set forth where the specific structure (cyclic, non-cyclic) is shown and all variable groups are

defined therein; wherein F is either N, O, S, Se or P; G is either N, O, S, Se or P, and so on in turn for X, n, Y, and m, according to the limitations found in claims 67, 68, 70 and 71. Applicant's election under this restriction requirement should result in a *single* defined cyclic core structure showing all rings therein, which are further functionalized by the R^1, R^2, as set forth in claims 67, 68, 70 and 71. Please see paragraph 2 above and the below explanations, including in paragraph 9 of why Group IV contains a large number of independent and distinct inventions.

V. Claim 69, drawn to a chemical library comprising a plurality of metal ions, classifiable in class 600, subclass 617, for example.

The inventions are distinct, each from the other because of the following reasons:

4. The inventions of Group I and inventions of Group II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the additional step of mutating a biological target molecule so as to introduce at least one amino acid residue capable of binding a metal ion may confer patentability upon the drug discovery processes of combination Group I, even though the drug discovery

process of subcombination Group II comprising contacting the biological target molecule with a test compound might not be patentable. The subcombination has separate utility such as drug discovery by itself or in other combinations.

5. The inventions of Groups I and II and the inventions of Group III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are not disclosed as capable of use together, and the drug discovery processes for identification of a small organic compound of Groups I and II are different modes of operation, function and effect from the process of identifying binding sites in or otherwise characterizing biological targets, including orphan receptors and other proteins of Group III.

6. The inventions of Group IV, etc., and the inventions of Groups I, II, and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the processes of using of Groups I, II, and III can be practiced with another materially different product, such as compounds of the general Formulae II-XIII, as taught by the instant specification at pp. 29-34. Furthermore, the products as claimed in Group IV, etc., may be used for scavenging or titration metal ions in solution, which is a different process of using from drug discovery, identifying

metal ion binding sites on biological target molecules or characterizing orphan receptors.

7. The invention of Group V and the inventions of Groups I, II, and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the process of using inventions of Groups I, II, and III can be practiced with another materially different product, such as compounds of the general Formulae I-XIII, as taught by the instant specification, pp. 27-34. Furthermore, the metal ion products as claimed in Group V, etc., may be used for electroplating of metals, which is a different process of using from drug discovery, identifying metal ion binding sites on biological target molecules or characterizing orphan receptors.

8. The inventions of Group IV, etc., and the inventions of Group V are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions the specification does not disclose that the chemical libraries comprising a plurality of test compounds of the general formula I, as claimed in the inventions of Group IV, etc., and the chemical library comprising a plurality of metal ions as capable of use together. Furthermore, the library comprising a plurality of metal ions of Group V may be used in electroplating, which is a mode of operation, function and effect that is different from

those of the libraries of test compounds. The instant specification, at p. 38, lines 5-26, and particularly line 19, differentiates between libraries of test compounds and metal ions, referring to "[l]ibraries of test compounds or of salt, solvates, or complexes of the above-mentioned metal ions . . . .[emphasis added]"

9. The inventions of claims 67, 68, 70 and 71 of Group IV, etc., wherein library of test compounds are specifically defined as to F, G, X, n, Y, and m of formula I, are test compounds with structurally distinct core structures and so that they are unrelated each to the other. Test compounds with structurally distinct core structures are thus deemed to normally constitute independent and distinct inventions within the meaning of 35 U.S.C. 121. Absent evidence to the contrary, test compounds with structurally distinct core structures are presumed to represent independent and distinct inventions, subject to a restriction requirement pursuant to 35 U.S.C. 121 and 37 CFR 1.1141 et seq. The examination of more than one structurally distinct core structure would now pose an undue burden on the Office.

10. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

11. This application contains claims directed to the following patentably distinct species of the claimed invention: biological target molecules that protein, nucleoproteins, glycoproteins, orphan receptors, nucleic acids, carbohydrates, and glycolipids (see p. 14, lines 18-20 and p. 18, line 31 to p. 20, line 3 of the instant invention).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-6, 47-51, 77 and 78 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

12. Claims 67 and 68 are generic to a plurality of disclosed patentably distinct species comprising R^1 and R^2, which are the same or different, are radicals selected from the group consisting of: hydrogen, C_1-C_{15} alkyl, C_2-C_{15} alkenyl, C_2-C_{15} alkynyl, aryl,

cycloalkyl, alkoxy, ester, -OCOR', -COOR', heteroalkyl, heteroalkenyl, heteroalkynyl, heterocycloalkyl, heterocycloalkenyl, heterocycloalkynyl or heteroaryl group, an amine, imine, nitro, cyano, hydroxyl, alkoxy, ketone, aldehyde, carboxylic acid, thiol, amide, sulfonate, sulfonic acid, sulfonamide, phosphonate, phosphonic acid group or a combination thereof, optionally substituted with one or more substituents selected from the same group as R^1 and / or a halogen such as F, Cl, Br or I; R' is hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, arylalkyl, substituted arylalkyl, heteroalkyl, substituted heteroalkyl, heteroalkenyl, substituted heteroalkenyl, heteroalkynyl, heteroaryl, substituted heteroaryl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkeny, heterocycloalky, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, heterocycloalkyl, substituted heterocycloalkyl, heterocycloalkenyl, or substituted heterocycloakenyl; R^1 and / or R^2 optionally forming a fused ring together with any of F, $(X)_n$ or a part of $(X)_n$, G, $(Y)_m$ or a part of $(Y)_m$ or R^1 and R^2 themselves forming a fused ring; X and Y are the same or different and have the same meaning as R' such as, CH_2-, $-CH_2-CH_2-$, $-CH_2-S-CH_2-$, $-CH_2-N-CH_2-$, $-CH=CH-CH=CH-$, $-(CH_2)_d-(Z)_e-(V)_f-(W)_g-(CH_2)_h$, $-CH_2-O-CH_2$, wherein each of Z and W are independently C, S, O, N, Se or P and V is –CH- or $–CH_2-$; e and /or g are an integer of 1-3, d, f and /or h are an integer of 1-7. It is evident that R^1 and R^2 may be defined, in part, by applicant's elective definitions for F, G, X, n, Y, and m; these elective definitions will be carried over into the instant election of species, according to the limitations of the claim. It is again noted that this election of species is different from the above restriction requirement for a test

compound core structure, should an invention of Group IV, etc., be elected. The instant species requirement set forth here is to elect a species of R^1 and R^2 in order to search. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, even though this requirement is traversed.

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

13. Claims 67 is generic to a plurality of disclosed patentably distinct species comprising a test compound that is chelated to a metal ion or atom that is selected from the group consisting of aluminium, antimony, arsenic, astatine, barium, beryllium, bismuth, boron, cadmium, calcium, cerium, cesium, chromium, cobalt, copper, dysprosium, erbium, europium, gadolinium, gallium, germanium, gold, hafnium, holmium, indium, iridium, iron, lanthanum, lead, lutetium, magnesium, manganese, mercury, molybdenum, neodymium, nickel, niobium, osmium, palladium, platinum, polonium, praseodymium, promethium, rhenium, rhodium, rubidium, ruthenium, samarium, scandium, selenium, silicon, silver, strontium, tantalum, technetium, tellurium, terbium, thallium, thorium, thulium, tin, titanium, tungsten, vanadium, ytterbium, yttrium, zinc, zirconium, and oxidation states and isotopes thereof; in particular aluminium, antimony, barium, bismuth, calcium, chromium, cobalt, copper,

europium, gadolinium, gallium, germanium, gold, indium, iron, lutetium, manganese, magnesium, nickel, osmium, palladium, platinum, rhenium, rhodium, rubidium, ruthenium, samariurn, silver, strontium, technetium, terbium, thallium, thorium, tin, yttrium, zinc, and oxidation states or isotopes thereof; in particular cobalt, copper, nickel, platinum, ruthenium, and zink, and oxidation states and isotopes thereof, preferably calcium (II), cobalt (II) and (III), copper (I) and (II), europium (III), iron (II) and (III), magnesium (II), manganese (II), nickel (II) and (III), palladium (II), platinum (II) and (V), ruthenium (II), (III), (IV), (VI) and (VIII), samarium (III), terbium (III), zinc (II), or isotopes thereof, preferably cobalt (II) and (III), copper (I) and (II), nickel (II) and (III), zinc (II) and platinum (II) and (V), or isotopes thereof. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, even though this requirement is traversed.

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

14. Claim 69 is generic to a plurality of disclosed patentably distinct species comprising a plurality of metal ions selected from the group consisting of aluminium, antimony, arsenic, astatine, barium, beryllium, bismuth, boron, cadmium, calcium, cerium, cesium, chromium, cobalt, copper, dysprosium, erbium, europium, gadolinium,

gallium, germanium, gold, hafnium, holmium, indium, iridium, iron, lanthanum, lead, lutetium, magnesium, manganese, mercury, molybdenum, neodymium, nickel, niobium, osmium, palladium, platinum, polonium, praseodymium, promethium, rhenium, rhodium, rubidium, ruthenium, samarium, scandium, selenium, silicon, silver, strontium, tantalum, technetium, tellurium, terbium, thallium, thorium, thulium, tin, titanium, tungsten, vanadium, ytterbium, yttrium, zinc, zirconium, and oxidation states and isotopes thereof; in particular aluminium, antimony, barium, bismuth, calcium, chromium, cobalt, copper, europium, gadolinium, gallium, germanium, gold, indium, iron, lutetium, manganese, magnesium, nickel, osmium, palladium, platinum, rhenium, rhodium, rubidium, ruthenium, samariurn, silver, strontium, technetium, terbium, thallium, thorium, tin, yttrium, zinc, and oxidation states or isotopes thereof; in particular cobalt, copper, nickel, platinum, ruthenium, and zink, and oxidation states and isotopes thereof, preferably calcium (II), cobalt (II) and (III), copper (I) and (II), europium (III), iron (II) and (III), magnesium (II), manganese (II), nickel (II) and (III), palladium (II), platinum (II) and (V), ruthenium (II), (III), (IV), (VI) and (VIII), samarium (III), terbium (III), zinc (II), or isotopes thereof, preferably cobalt (II) and (III), copper (I) and (II), nickel (II) and (III), zinc (II) and platinum (II) and (V), or isotopes thereof. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, even though this requirement is traversed.

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the

case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

15. For this response to be complete and for search purposes, applicants should provide the ***chemical structure of elected compounds species***, wherein each specific formula substituents of each of the above identified elected species are defined either by picture, or by expressing the species in terms of the variables of the formula.

16. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

17. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Shibuya whose telephone number is (571) 272-0806. The examiner can normally be reached on M-F, 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Shibuya
Examiner
Art Unit 1639

PADMASHRI PONNALURI
PRIMARY EXAMINER